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ABSTRACT

To assess the long-term effects of an intensive, five-year day care intervention by the Syracuse University Children's Center with children from multi-risk, low-income families, 65 program participants and 54 comparison subjects were questioned when they were in the eighth and ninth grades. Additional data were gathered from their parents and teachers. Lengthy questionnaires administered to children, parents, and teachers focused on children's social interaction, emotional well-being, self-esteem, creativity, and academic achievement. Patterns in the data were located with Guttman's facet analytic approach to test analysis. Items were reviewed and a simple mapping sentence was written to capture the content of most items. Items were recoded to insure that all were scored in the same direction with respect to the range of the mapping sentences. Variables were intercorrelated and a Smallest Space Analysis (SSA) was performed on the correlation matrix. Correspondences were sought between facets and the empirical organization of the items in the SSA analysis. A high degree of correspondence was found. To compare participants with controls, sum scores were assigned and a multivariate analysis of variance was performed. A significant effect was found for the interaction between intervention group and sex on the teacher questionnaire only. Supporting previous findings, MANOVAs for males and females revealed lasting intervention effects for girls only. (RH)

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Syracuse University Longitudinal Follow-Up Study: Questionnaire Ratings of Children's Behaviors, Attitudes and Achievement

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Paper presented at the meetings of the Society for Research in Child Development, April 23, 1987, Baltimore, Maryland

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Syracuse University Longitudinal Follow-Up Study: Questionnaire Ratings of Children's Behaviors, Attitudes and Achievement

The Family Development Research Program was designed to test the hypothesis that good quality intensive intervention with very low-income infants and their families would improve the well-being of these infants. Between 1969 and 1975 eighty-two children were provided care in the Syracuse University Children's Center. These children were all members of multi-risk families in which family income was very low and parents had less than a high school education. In a large majority of families the mother was rearing the child without a male partner, and the mother had either no work history or a history of unskilled or semi-skilled work. Mothers were an average age of 18 years at the birth of the child. While the infants were at social disadvantage, they all were products of normal full term pregnancies and deliveries.

The program children were provided daily care in the center 50 weeks a year from age 6 months to 60 months. The aim of this model program was to create an environment for children that would foster both good intellectual and socioemotional development, including characteristics such as positive self esteem, self confidence, creativity, excitement in learning, internal motivation, and concern for others. In addition to offering a model center-based infant and child program, the project also acknowledged that the family is the most permanent and potent part of the child's environment, and that any effective intervention must involve the child's family. Families were encouraged to participate actively in the center-based program. Also, each family was visited once a week by a home visitor who acted as a support to the parents. This home visitor worked to help parents with issues of child-rearing, family relations, employment and functioning within their community (Honig, 1977; Honig & Lally, 1982; Lally & Honig, 1977).

For research purposes, a comparison group of children that did not receive services was recruited when the program children were thirty-six months old. The comparison children were matched to the program children by maternal age, sex of child, race of child, birth order, and parent marital status. At the end of the intervention program, kindergarten- and first-grade-age program children were more pro-social in their actions with adults and peers and more active in getting their educational needs met than the comparison children. Standardized tests of cognition and language showed early differences in ability, with program children clearly superior in functioning to comparison children.

Since the true effectiveness of an early intervention is whether a child's growth continues to be enhanced past the intervention period, an effort was recently made to locate the program and comparison children approximately seven years after their graduation from the Syracuse University Children's Center. Sixty-five program children and fifty-four comparison children, ages 13 to 16, were relocated when they were in the eighth and ninth grades, and a variety of data were collected about them and their families (Mangione, 1987). Among the measures administered during this early-adolescent follow-up assessment were three questionnaires. Each questionnaire contained a similar set of approximately one hundred questions that dealt with issues related to the original goals of the intervention, including children's social interaction, emotional well-being, self esteem, creativity, and academic achievement. One questionnaire was given to the study children themselves, one questionnaire to the their parents, and one questionnaire to three teachers of the study children. Since for over half of the children only one teacher returned the questionnaire, it was decided to use only one teacher questionnaire per child. For children on whom two or three

questionnaires were available, one was randomly selected to be used in the analysis of teacher ratings. Teacher and child questionnaire items were rated on 6-point scales, parent questionnaire items on 4-point scales, in which the end points ranged from "a lot like child" to "not at all like child." Items were balanced for positive and negative statements. [Questionnaires are available from J. Ronald Lally and Peter Mangione, Far West Laboratory for Educational Research and Development, 1855 Folsom Street, San Francisco, California 94103.]

Rather than use factor analysis or some other exploratory procedure for developing scale scores from these questionnaires, we chose to use Louis Guttman's facet analytic approach to test analysis. Guttman's facet approach is a procedure that has been advocated as a strong confirmatory methodology for theory development in the social sciences (Anastasi, 1983; Shye, 1978). It is a confirmatory procedure that involves three stages:

1. Outlining a formal system of definitions for the universe of observations to be studied;
2. Determining the empirical structure of the observations; and
3. Looking for correspondences between the definitional system and the empirical structure.

For the first stage of the process, we began by reviewing the content of the items on the questionnaires and writing a simple mapping sentence that captured the content of most of them. (See Figure 1.)

Figure 1

This mapping sentence has only two facets, one with four elements and another with three elements. The A Facet specifies four classic components of behavior: attitude, involvement, achievement, and self control. The B Facet specifies

three out of the many possible objects of a child's behavior: him- or herself, other people, and school. The cross product of these two facets yields twelve possible types of observations. Eight of these cross-products, or structuples as they are called in facet theory technical literature--were represented on the questionnaires.

Below is a complete list of items taken from the teacher questionnaire that fell into the different categories.

Direction of attitude toward self (a b)
1 1

10. Is poised.
15. Is self-confident.
23. Appears depressed.
30. Seeks constant reassurance.
44. Appears generally happy.
51. Is animated and enthusiastic.
54. Seems tense most of the time.

Direction of attitude toward other people (a b)
1 2

37. Is friendly.
64. Gets pleasure from working closely with another student.

Direction of attitude toward school (a b)
1 3

67. Takes pleasure in a job well done.
78. Values school and school activities.

Involvement with self (a b)
2 1

No examples.

Involvement with other people (a b)
2 2

No examples.

Involvement with school situation (a b)
2 3

7. Is motivated to work and expends effort.
21. Is alert and interested in school work.
41. Is uninterested in subject matter.
76. Pays attention.
84. Spends more than half of class time on mastery activities.
85. Spends more than half of class time without any focused activity.

Achievement with regard to self (a b)
3 1

No examples.

Achievement with regard to other people (a b)
3 2

11. Gets along badly with adults.
17. Puts people at ease.
35. Is well received by other pupils.
48. Has few or no friends.

Achievement with regard to school (a b)
3 3

3. Reads poorly.
6. Uses language well in expression of self and ideas.
12. Is good at school work.
14. Will do well in school work in future classes.
24. Retains learning well.
56. Is not a logical thinker.
60. Is a superior student.
70. Has few skills or talents.
87. Has mastered the academic content of this class to this point.
88. Is an underachiever.

Control of impulses with respect to self (a b)
4 1

No examples.

Control of impulses with respect to other people (a b)
4 2

34. Is aggressive toward peers.
52. Would hurt someone just for the "heck of it."
53. "Loses head" easily.
63. Gets violent if doesn't get way.
75. Is aggressive toward teachers.

Control of impulses with respect to school situation (a b)
4 3

4. Is willing to listen to advice.
20. Is resistant to teachers.
31. Is impulsive.
33. Requires continuous supervision.
38. Is easily led into trouble.
39. Resents discipline.
42. Disrupts classroom procedure.

Similar sets of items were selected from the parent and student questionnaires.

For the second stage of the process we recoded the items so that they were all scored in the same direction with respect to the range of the mapping sentence (i.e., so that desirable behavior had higher scores). We then intercorrelated these variables and performed a Smallest Space Analysis (SSA)

on the correlation matrix. Smallest Space Analysis is a type of nonmetric multidimensional scaling that arranges items in a Euclidean space so that those items with higher correlations are closer to one another and those with lower correlations are further apart.

Figure 2

For the third stage of the facet analysis we looked for correspondences between the facets in the mapping sentence and the empirical organization of the items in the SSA analysis. Figure 2 shows the arrangement of the teacher questionnaire items in the two-dimensional output space from the SSA. Items are identified by structuple numbers from the mapping sentence. Items with the same structuples form clear radial regions of the space. The self items are in the upper left of the plot, people the upper right and school at the bottom. Each of these can be further divided according to the behavior component facet. Lines drawn on the figure divide items with same structuples from items with other structuples. There is a high degree of correspondence between the facet categories and the empirical structure of the items. Thus, the empirical analysis confirmed the validity of the original facets presented in the mapping sentence. The structure of the items is a radial one around a center point. The correspondence is actually rather clean with only a few minor curves in the lines.

The parent and student questionnaires were broken down into the same facets and analyses produced similar structures.

Although comparison of groups is not always part of the facet theory process, we were interested in using these facet categories to compare the functioning of the program and control groups. We gave the children sum scores of the items in each of these categories on each questionnaire.

For each of the questionnaires, we computed a multivariate analysis of variance with the sum scores as the dependent variables and with intervention group and sex as independent variables. On the parent questionnaire there was no significant intervention group, sex or interaction effects for any of the eight summary scores. Similarly for the student questionnaire there were no statistically significant main effects for intervention group or sex, nor an interaction effect between sex and intervention group. For the teacher questionnaire, multivariate analysis of variance of the eight dependent variables yielded a significant multivariate effect for the interaction between intervention group and sex ($F(8,88)=2.452$, $p=.019$). To interpret this interaction, we computed MANOVAS separately for the males and females, using intervention group as the independent variable.

Figure 3

For the males there were no significant group differences. For the females, there was not a significant multivariate effect for group($F(8,37)=1.810$), but several of the univariate tests were significant. Compared to other girls, treatment-group girls had more positive attitudes toward themselves ($F(1,44)=10.244$, $p=.003$) (higher self esteem, felt better about themselves) and more positive attitudes toward other people (liked and enjoyed other people) ($F(1,44)=4.691$, $p=.036$). Treatment-group girls had greater achievement in school ($F(1,44)=4.212$, $p=.046$) and better control of their impulses with respect to other people, meaning they were less likely to be aggressive, mean, or violent toward other people ($F(1,44)=4.026$, $p=.051$). On the other four dependent variables, while there were no significant differences between the intervention and control groups, the mean scores for

the intervention-group girls were always more positive than for the control-group girls. Figure 3 illustrates the mean differences for each of the sex by intervention groups.

Discussion

The above analyses of teacher, parent, and child questionnaire data suggest strongly that good quality intensive intervention has long-lasting positive effects for low-income children. This finding is nevertheless a qualified one: effects were only found on outcome variables based on teacher questionnaires and only for female children. These qualifications need further consideration.

Why were the differences so strong for the teacher questionnaires, but not for the student questionnaires or the parent questionnaires? Two factors suggest that the teacher ratings have provided more objective and reliable data than the other two questionnaires. First, the teachers, but obviously not the children or parents, were blind to the purpose of the study and to whether the child they were rating was from the intervention or control group. Second, teachers may be more reliable repondents to highly structured and repetitive rating scales than poorly educated low-income mothers or early adolescent children. Semi-structured interviews of the same children and parents did yield some findings related to child's program participation (Lally, 1987).

Why is a lasting effect of the intervention only seen for the girls? This is not the first early intervention project to report such a finding. Gray (1983) reported similar long term follow-up effects that only impacted girls. Because these sex differences emerged in the present study only after the end of the intervention period, one must search for an explanation in the lives of the children after the age of school entry.

Perhaps the easiest and most benign explanation for these differences lies in the failure of public school education to provide the kind of stimulation necessary to sustain the interest of a boy into his adolescence, no matter how bright and curious he is at time of school entry. It has often been argued that the American educational system is "female-centric" in its activities and personnel; we suspect that even deeper and more difficult to remedy factors may explain the failure to sustain the effects of intervention in the Syracuse male children.

We believe that families, school-systems and the society at large have very different expectations of low-income boys and girls. The expectations of failure and irresponsibility are stronger for low-income male children than for female children and these expectations may be too strong to sustain the effects of an intervention over a period of ten years.

Similarly, among lower-income youth, the male peer network may be too strong, and too negative in its influence, to allow the effects of early intervention to be sustained.

The lack of strong male role models in most of the homes--program and comparison--may be an additional factor related to the apparent failure of intervention with the males. By contrast many of the program girl children had relatively strong female role models in their homes because the intervention worked with the mothers to further their education and employment possibilities. Program female children also had additional strong same-sex role models in their home visitors and other program personnel.

While the Family Development Research Program data set may contain some information to help clarify some of the above hypotheses about the sex interaction in program effectiveness, none has yet been explored. In the meantime, the lesson that we have learned is the importance of thinking about such issues as the world into which we send young children after preventive

intervention programs, how our programs might best be able to prepare children for this world, and how our programs might be able to change the realities of the world for these children after their graduation.

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Figure 1

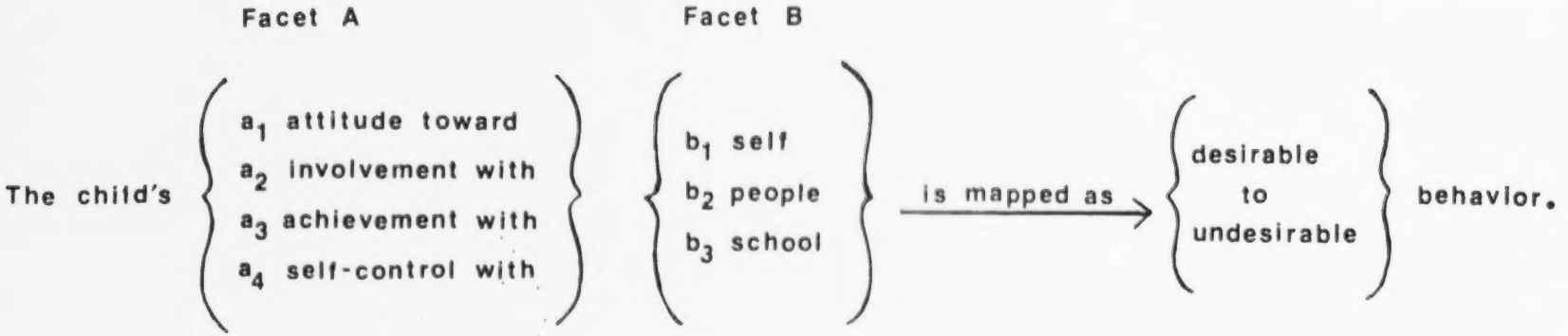

Facet A
Facet B
The child's
a_1 attitude toward
a_2 involvement with
a_3 achievement with
a_4 self-control with
b_1 self
b_2 people
b_3 school
is mapped as
desirable
to
undesirable
behavior.

Figure 2

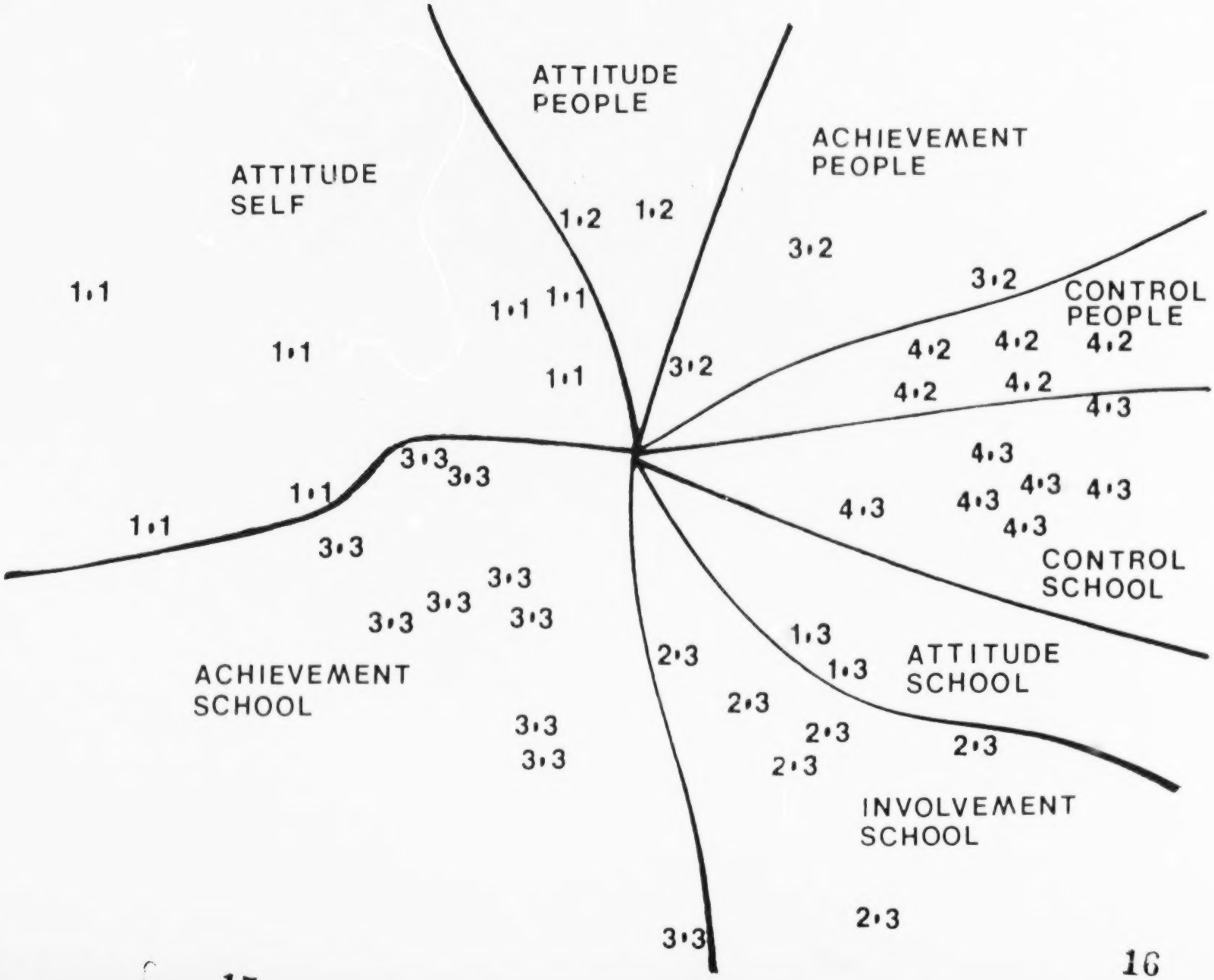
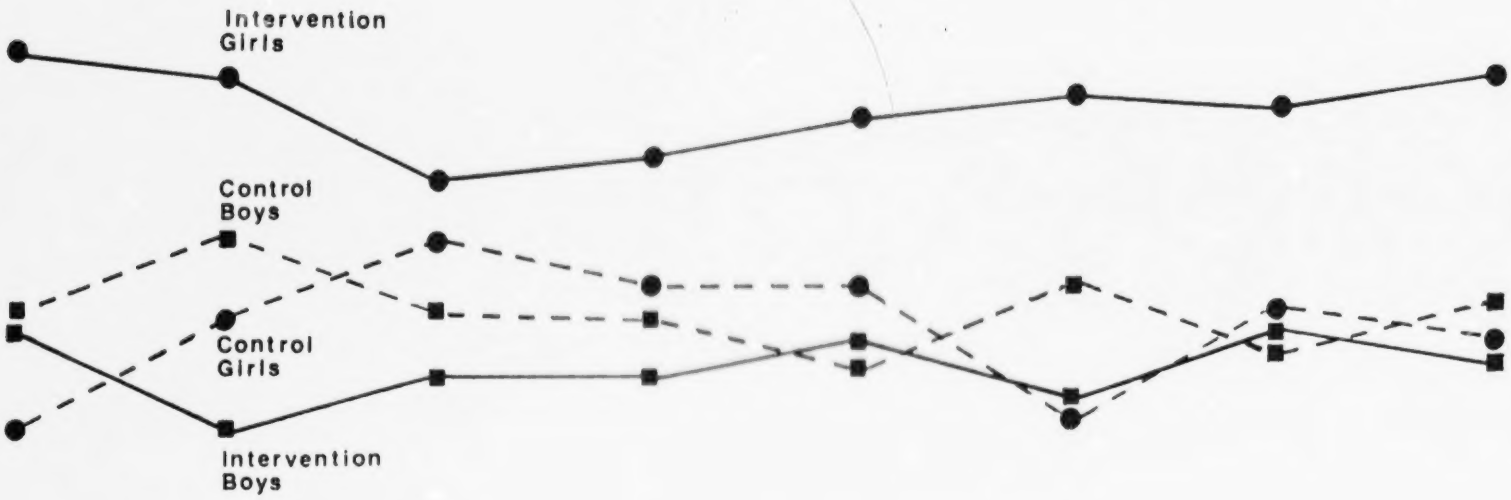

ATTITUDE PEOPLE
ACHIEVEMENT PEOPLE
ATTITUDE SELF
CONTROL PEOPLE
CONTROL SCHOOL
ATTITUDE SCHOOL
ACHIEVEMENT SCHOOL
INVOLVEMENT SCHOOL
1,1
1,2
3,2
4,2
4,3
3,3
2,3
1,3

Figure 3



SELF PEOPLE SCHOOL | SCHOOL | PEOPLE SCHOOL | PEOPLE SCHOOL

ATTITUDE | INVOLVEMENT | ACHIEVEMENT | SELF-CONTROL